Name: Date:

Polynomial Factoring solution (version 664)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-96}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{6}\, i}{2}$$

$$x = -1 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 5i$ and $-8 - 3i$ in standard form $(a + bi)$.**

Solution

$$(2 - 5i) \cdot (-8 - 3i)$$

$$-16 - 6i + 40i + 15i^2$$

$$-16 - 6i + 40i - 15$$

$$-16 - 15 - 6i + 40i$$

$$-31 + 34i$$

Polynomial Factoring solution (version 664)

3. **Write function $f(x) = x^3 + 3x^2 - 36x - 108$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	3	-36	-108
6		6	54	108
	1	9	18	0

$$f(x) = (x-6)(x^2+9x+18)$$

$$f(x) = (x-6)(x+3)(x+6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+5)\cdot(x+1)^2\cdot(x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.